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UNITED STATES DEPARTMENT OF AGRICULTURE  
OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING  
Washington, D. C.

FIELD LETTER No. 32  
October 15, 1917.

Logan Waller Page, Director.

P. St. J. Wilson, Chief Engineer; J. E. Pennybacker, Chief of Management; Samuel Fortier, Chief of Irrigation Investigations; S. H. McCrocy, Chief of Drainage Investigations; E. B. McCormick, Chief of Rural Engineering; Prevost Hubbard, Chief of Tests.

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FEDERAL AID  
Administration

The Certificate of Apportionment for the fiscal year ending June 30, 1919, was issued by the Secretary September 8, for the apportionment of \$14,550,000 among the several states. The largest apportionment was made to Texas and amounts to \$876,986.70.

Thirty-eight new project statements were received in September, as follows: Alabama Nos. 12, 16, 17, 19, 20 and 23; Arkansas Nos. 3 and 4; Colorado Nos. 3, 4, 5 and 6; Florida No. 1; Georgia No. 6; Louisiana Nos. 8 and 13; Massachusetts No. 6; Minnesota Nos. 11 and 15; Mississippi Nos. 3, 6, 7 and 8; Missouri No. 3; New York Nos. 1, 2, 3 and 4; North Carolina Nos. 8 and 16; Ohio Nos. 4, 5, 6 and 7; Oregon No. 1; Utah No. 1; Vermont No. 9, and Wyoming No. 3.

The Secretary approved 40 project statements, the largest number approved so far in any one month.

B. J. Finch, S.H.E., attended conventions at Spokane and Bellingham, Washington, and accompanied by the Chief Engineer made a trip over post and national forest roads in Oregon.

J. T. Schuyler, S.H.E., inspected Washington Post Road No. 1, and Oregon No. 2. He was assisted by J. H. Bright, S.H.E., on the latter project.

F. D. Hudgins, S.H.E., spent nearly all of September in inspecting proposed Federal Aid projects in a number of counties in North Dakota.

Corrected plans for Minnesota Project No. 3, Mille Lacs County, and plans for Minnesota No. 11, Goodhue County, were received by the District Engineer, and forwarded to Washington. Plans for Minnesota No. 1, Pine County, were returned to the State Highway Department for corrections.

Highway Engineer H. K. Craig spent the month on inspections in Arkansas. Arkansas Project Statement No. 4 was forwarded to the Washington Office. Nos. 5, 6 and 7 have been received by the District Engineer.

George C. Scales went over the mail routes of Minnesota No. 7. He also made several inspection trips to Chisago County in connection with construction work on Minnesota No. 2, which was started September 6 and is now well under way. He also made several trips to St. Paul conferring with the State Highway Department of Minnesota.



UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF PLANT INDUSTRY  
WASHINGTON, D. C.

FIELD LETTER  
October

Report of the Director, Bureau of Plant Industry, for the year ending September 30, 1919. The report is divided into two parts: (1) General Administration, and (2) Field Work. The first part contains a summary of the work of the Bureau during the year, and the second part contains a detailed account of the work of the various field stations.

### ADMINISTRATIVE AID

The Certificate of Appropriation for the fiscal year ending September 30, 1919, was issued by the Secretary September 8, for the appropriation of \$14,550,000 among the several states. The largest appropriation was made to Texas and amounts to \$3,638,900.

Thirty-eight new project statements were received in September from the following states: Alabama Nos. 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21; Arkansas Nos. 1, 2, 3, 4, 5 and 6; Florida Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 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The report also contains a list of the names of the persons who have been appointed to the various field stations during the year.

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W. H. Rhodes, S.H.E., has reported to the National Army Cantonment at Ayer, Massachusetts.

George C. See, S.H.E., reported for duty in District 8, September 22, spent one day on an inspection of Georgia Project No.6 and the remainder of the month in Montgomery office reviewing plans, profiles, etc., in connection with several Alabama and Georgia projects.

C. L. Brown, S.H.E., is on an inspection trip through West Virginia, looking after West Virginia No.1 and other projects for which project statements are expected to be submitted shortly.

#### National Forest Roads

District Engineer Hewes inspected three projects, the Blewett Pass, Sunset Highway, and Cle Elum, Washington, and the Columbia Highway, Oregon.

Senior Highway Engineer Schuyler spent about ten days in finishing report and plans on the Middle Elk road, in the Siskiyou National Forest, Oregon, and the location plans of the Tiller Trail.

J. H. Bright, S.H.E., was engaged on reconnaissance surveys of the McClellan Pass, Ranier National Forest, Washington, Grants Pass and Oregon Caves, Oregon, projects.

A section of the McClellan Pass project, Washington, was reconnoitered by J. W. Ball, J.H.E., assisted by A. L. Maule, surveyman, and report was prepared thereon. Mr. Ball also was engaged on the location survey of the Flora-Enterprise Road in Oregon.

B. F. Beezley, S.R.C., was engaged the entire month on reconnaissance survey of the Pilot Rock Prairie City project and in preparing reconnaissance report on the McKenzie River Road, both in Oregon.

The war conditions have seriously affected the Forest work in Arizona and New Mexico. O. N. Powell, H.E., was required to leave at the time construction was starting and J. H. Stoggs, S. H.E., who had just acquainted himself with conditions, was ordered into military service and is at the Officers' Reserve Camp at Ft. Leavenworth, Kansas. W. H. Lynch, S.H.E., was assigned to take charge temporarily of the forest road work for these two states.

Mr. D. L. MacBeath, Supt. of Road Construction, was assigned to construction work on the Winslow-Long Valley Road, Arizona.

Since the appointment of H. H. MacPherson as Chief of Party, decided improvement has been noted in the work on the Clifton-Springerville Survey, Arizona.

George C. See, S.H.E., reported for duty in District 3, Spokane, W.T., on May 1, 1914. He was reported to have been in the National Army during the war.

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O. J. Brown, S.H.E., is on a leave of absence from his position in the National Army. He was reported to have been in the National Army during the war.

National Forests

The National Forests are located in the following States: Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming.

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H. A. Calkins, S.R.C., completed the North Fork reconnaissance survey and the reconnaissance location of 50 miles on the Yaak Valley project was completed by A. V. Williamson, S.R.C.

Reconnaissance survey is being made of Swan River project by C. W. Cheatham, S.R.C., recently transferred to this district from District 1.

CONSTRUCTION AND MAINTENANCE  
Experimental Roads

J. H. Dodge, S.R.C., is supervising the maintenance of the Chapawamsic Road in Prince William County, Virginia. Contract has been let to Hainey & Boatwright, Quantico, Virginia, for the much needed repairs.

A. C. Dunn, J.H.E., spent the best part of the month on general plans for the Columbia Pike.

E. C. Glascock completed work on the Mount Vernon Road September 17, as D. G. Haire, S.R.C., was assigned to Fort Riley, Kansas, September 2 to assist B. H. Burrell, S.H.E., on cantonment work.

The following sections of experimental roads were retreated during the month:

- 2 and 3 of the Mount Vernon Road;
- 1 of the Gum Spring Road, both in Fairfax County, Va.
- 13, 14 and 15 of the Mount Vernon Avenue Road, and
- 4 of the Russell Road in Alexandria County, Va.

General

C. H. Moorefield, S.H.E., has accepted a position with the U.S. Navy Department in Haiti.

A. C. Dunn, 2d. Lieut. has been put on the "Inactive Roll" of the War Department, and has returned to duty in this Office.

R. E. Royall, J.H.E., resigned September 11 from this Office to accept a position with the South Carolina State Highway Department.

On September 19, W. L. Spoon, S.H.E., returned to Burling, N.C., to await further instructions from this Office, having been advised that the cantonment work at Columbia, S.C., was practically finished, but he was recalled and returned to Columbia on the 22d.

J. T. Pauls, who is in charge of road work under the Constructing Quartermaster at Rockford, Illinois, reports that up to September 22 the following mileage was built:

Macadam.....	26,000 ft.
Gravel.....	11,200 ft.
Earth.....	9,620 ft.





Additional roads proposed now under construction:

Macadam..... 7,410 ft.  
Gravel..... 16,110 ft.  
Earth..... 7,360 ft.

S. L. Taylor has received a commission as 2d. Lieut. in the Officers' Reserve Corps.

#### ECONOMICS

##### Economic Highway Surveys

The economic highway surveys of the roads in eastern and southern Maryland was completed, and arrangements were made to have a similar survey made in the eastern and southern part of New Jersey during the month of October. The field work in New Jersey will be carried on by W. E. Rosengarten and W. H. Barton, assisted by two representatives of the State Highway Department of New Jersey.

##### Maintenance Studies

Field studies of maintenance systems and methods were conducted during the month by J. L. Harrison in New York and the New England states. During the latter part of the month inspections were made by Mr. Harrison in Ohio and Michigan.

##### State Management and Procedure Studies

M. O. Eldridge, B. E. Gray, and G. C. Clarke were engaged during the month on the final draft of the bulletin on State Highway Organization and Maintenance. Mr. Gray and Mr. Clarke both reported for duty as engineer economists on September 1.

##### Publications

Office of the Secretary - Circular No. 74 "State Highway Mileage and Expenditures for the Calendar Year 1916", was issued September 24, 1917.

##### Exhibits

Road models were on exhibition during the month as follows:

Industrial Exposition and Fair, Cleveland, Ohio, September 1-9;  
State Fair, Hutchinson, Kansas, September 17-22;  
Rochester Exposition, Rochester, New York, September 3-8.

Additional roads proposed for construction:

..... 7,410 ft.  
..... 16,110 ft.  
..... 7,380 ft.

2. L. Taylor has received a commission as 2nd Lieutenant in the Officers' Reserve Corps.

## ECONOMICS

### Jersey Highway Survey

The second highway survey of the roads in eastern and southern Maryland was completed, and arrangements were made to have a similar survey made in the eastern and southern part of New Jersey during the month of October. The field work in New Jersey will be carried on by W. E. Rosenberger and W. H. Barton, assisted by two representatives of the State Highway Department of New Jersey.

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### Exhibits

Reel models were on exhibition during the month.

Industrial Exposition and Fair, Cleveland, Ohio, 1917-18;  
State Fair, Hutchinson, Kansas, September 1917;  
Rochester Exposition, Rochester, New York, September 1917.



## TESTS AND RESEARCH Administration

Dr. George E. Ladd was appointed to the position of Economic Geologist on September 1. B. Kammass, laboratory helper, resigned September 11 to take a position with the Iowa State Highway Commission. E. Hummer, laboratory assistant, resigned September 9.

During the week of September 9, Mr. Hubbard attended the annual convention of the American Chemical Society and a meeting of the Chemistry Committee of the National Research Council in Boston. He inspected the experimental bituminous roads at Newton, Massachusetts, and also Hillside Avenue, Jamaica, New York. On September 24 he attended a meeting of the Chemistry Committee of the National Research Council in New York City, held during the Chemical Exposition.

## Routine Tests and Analyses

During September 47 samples of bituminous material were examined in the Chemical Laboratory; 176 samples of rock, sand, gravel, etc., were examined in the Physical Laboratory; and 64 samples were examined and classified in the Microscopic Laboratory.

## Research upon the Properties of Dust Preventives and Road Binders.

Investigations were continued upon the thickness of bituminous films on various types of mineral aggregates. In general it has been ascertained that the consistency of the bituminous material at normal temperature has very little to do with the thickness of film retained on the heated mineral particle.

Most of the data necessary for the revision of the typical specifications for bituminous materials has been received and it is hoped that a complete set of typical specifications may be issued shortly.

An ultra violet ray lamp has been installed for the purpose of making accelerated exposure tests on bituminous materials.

## Experimental Bituminous Construction

It is of interest to note in the inspection which was made by Mr. Hubbard at Newton, Massachusetts, in company with the Street Commissioner, it was found that experiments Nos. 9 and 10, two of the first in this country to have been constructed with refined water-gas tar were in practically perfect condition. The only maintenance which the Street Commissioner reports upon these sections was their surface treatment during the past two years with from  $\frac{1}{4}$  to  $\frac{1}{3}$  of a gallon of tar applied cold. Progress reports on these experiments, which were begun in 1908 were discontinued in 1915 owing to the fact that reliable data as to maintenance could not be obtained.

# RESEARCH LABORATORY

Dr. George E. Ladd was appointed to the position of Economic Geologist on September 1. E. Hammar, Laboratory helper, resigned September 11 to take a position with the Iowa State Highway Commission. E. Hammar, Laboratory Assistant, resigned September 9.

During the week of September 9, Mr. Hubbard attended the annual convention of the American Chemical Society and a meeting of the Chemistry Committee of the National Research Council in Boston. He inspected the experimental apparatus at Newton, Massachusetts, and also Hillsdale, New Jersey. On September 24 he attended a meeting of the National Research Council in New York City, held during the week of September 24.

## RESEARCH

During September 47 samples of bituminous material were examined in the Chemical Laboratory; 176 samples of coal, lignite, etc., were examined in the Physical Laboratory; and 62 samples of bituminous material were examined in the Microscopic Laboratory.

## RESEARCH ON THE PROPERTIES OF DUCTILE MATERIALS AND ROAD BITUMENS

Investigations were continued upon the thickness of bituminous films on various types of mineral aggregates. In general it has been ascertained that the consistency of the bituminous material at normal temperature has very little to do with the thickness of film retained on the heated mineral particles.

Most of the data necessary for the revision of the typical specifications for bituminous materials has been received and it is hoped that a complete set of typical specifications may be issued shortly.

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## EXPERIMENTAL BITUMINOUS CONCRETION

It is of interest to note in the inspection which was made by Mr. Hubbard at Newton, Massachusetts, in company with the Street Commissioner, it was found that experiments Nos. 9 and 10, two of the first in this country to have been constructed with refined water-gas tar were in practically perfect condition. The only maintenance which the Street Commissioner reports upon these sections was their surface treatment during the past two years with from 1/4 to 1/2 of a gallon of tar applied cold. Progress reports on these experiments, which were begun in 1906 were discontinued in 1916 owing to the fact that reliable data on maintenance could not be obtained.



### Non-bituminous Road Material Investigations

Messrs. Jackson and Mitman returned from their field investigations of rock quarrying, crushing and screening plants in the New England and Middle Atlantic States and are working their data into shape for publication in the form of a bulletin.

Dr. Ladd is engaged on the preparation of a bulletin dealing with the installation and operation of small quarrying, crushing and screening plants for the use of contractors and engineers.

The study of a modification of the abrasion test was continued in the physical Laboratory. In the work so far done it appears that the elimination, by means of a slotted cylinder, of the dust cushion formed by abrasion will give a much greater range in wear among the least resistant types of rocks than does the present standard method.

### Soil Pressure Investigations

Tests with circular bearing blocks to determine the distribution of pressures through sand fills have been continued.

Tests on the pressures due to hydraulic fills were discontinued in order to increase the height of the experimental stand-pipe at Arlington Farm. It is expected that these tests will again be in operation during the month of October.

Lack of help has prevented the testing of the large reinforced concrete slab poured several months ago.

### IRRIGATION INVESTIGATIONS

#### Utilization of Water

R. B. Sleight, A.I.E., arrived in Washington early in October, and will remain several weeks. The last station at the Denver laboratory was discontinued the first of the month. Results from the floating tanks are expected to show the relation of evaporation depths from floating pans of various sizes and shapes. The sand surface work at the laboratory itself was completed early in September. Basic meteorological observations and water surface evaporation figures will be recorded until late in the year.

W. L. Rockwell, S.I.E., attended a conference in Austin, Texas, September 19, with the state board of water engineers, at which plans for the extension of the duty of water experiments now being conducted in cooperation were discussed. The board agreed to continue the work at the Rio Grande station and to the location of a new station in Nueces Valley. A third station will probably be started in northwest Texas, the exact location not being determined as yet owing to the fact that work will not be undertaken at it until next spring.

H. H. Kidder has been appointed Assistant Irrigation Engineer, and will be assigned to duty of water investigations in Texas.

## Investigations

Mr. Jackson and Mr. M. H. Kidder, who are in charge of the investigations, are working on the problem of the erosion of the river bed at the mouth of the river.

The study of the erosion of the river bed is being continued in the physical laboratory. In the work so far done it appears that the elimination of the sand dunes, of the sand dunes formed by erosion will give a much greater range in wear among the least resistant types of rocks than does the present standard method.

## Soil Pressure Investigations

Tests with circular bearing blocks to determine the distribution of pressures through sand fills have been continued. Tests on the pressures due to hydraulic fills were discontinued in order to increase the height of the experimental stand-pipe at Arlington Farm. It is expected that these tests will again be in operation during the month of October.

Lack of help has prevented the testing of the large reinforced concrete slab poured several months ago.

## IRRIGATION INVESTIGATIONS Utilization of Water

R. B. Slaght, A. I. E., arrived in Washington early in October, and will remain several weeks. The work station at the Denver Laboratory was discontinued the first of the month. Results from the floating tanks are expected to show the relation of evaporation depths from floating pans of various sizes and shapes. The sand surface work at the laboratory itself was completed in September. Basic meteorological observations and water surface observations will be recorded until late in the year.

W. L. Rockwell, S. I. E., attended a conference in Austin, Texas, September 19, with the state board of water engineers, at which plans for the extension of the duty of water experiments now being conducted in cooperation were discussed. The board agreed to continue the work at the Rio Grande station and the location of a new station in Mesas Valley. A third station will probably be started in northwest Texas, the exact location not being determined as yet owing to the fact that work will not be undertaken at it until next spring.

H. H. Kidder has been appointed Assistant Irrigation Engineer, and will be assigned to duty of water investigations in Texas.



Farmers' Bulletin No. 828, Farm Reservoir, by Dr. Fortier is being distributed.

T. H. McCarthy, A.I.E., who completed his detail on the investigation of flow of water in metal pipes early in September, is in Colorado assisting on the Cache la Poudre reservoir surveys.

W. W. McLaughlin has been granted leave without pay by the Secretary in order to undertake a brief investigation in Bear River Valley of Utah and Idaho preparatory to testifying in an important suit between the irrigation and power interests in the valley. Mr. McLaughlin's appearance in this litigation was urged by various interests involved, on account of his close acquaintance with conditions in the valley.

Farmers' Bulletin No. 863, Irrigation of Grain, by W. W. McLaughlin, a revision of Farmers' Bulletin No. 399, is being distributed.

#### Appliances & Equipment

The irrigation model constructed under the direction of this division last winter, has been loaned to Cornell University, and will be installed in one of its laboratories.

F. J. Viehmeyer, A.I.E., spent practically the entire month in Imperial Valley on silt investigations. An ingenious silt sampler has been found for this work and is now in use, displacing cruder methods employed heretofore. Special work of taking silt samples on 4 main canals in the valley, 3 smaller typical canals, and Alamo Canal were taken to determine the relation of velocities to silt contents.

A set of preliminary experiments to determine methods of overcoming backlash below drops in canals was started by V. M. Cone, I.E., at the Fort Collins laboratory. As far as they were carried the tests indicated a promising field for investigation, and will be continued.

#### Measurement of Water

F.B. No. 813, Construction and Use of Farm Weirs, by V.M.Cone, is being distributed.

#### Customs, Regulations and Laws

The Supreme Court of Idaho, on the rehearing of the case of the Commissioners of Drainage District No. 1 of Canyon County, vs. Farmers' Cooperative Irrigation Company et al, upheld the power of a drainage district to assess high lands and irrigation canals that contribute to the water logging of lower lands. The court held that (1) it is within the power of the legislature to restore the common law rule that one diverting water from its natural channel is liable for all damages that may result from the escape of such water; that (2) the liability is the same whether the injury is caused by percolating or seepage water or by water flowing on the surface; and that (3) the enhancement of value of a tract must be considered as well as the amount of water contributed in determining the proportion of the costs of the district such a tract shall pay.

Frank Adams, I.M., accompanied R.P. Teele on his trip to Oregon, in the interests of his study of irrigation districts.

is being published in the Journal of the American Society of Tropical Medicine and Hygiene, Vol. 1, No. 1, 1922, page 1-10.

The investigation was conducted under the direction of this division last winter, and has been placed in the hands of the Division of Tropical Medicine and Hygiene, and will be published in the Journal of the American Society of Tropical Medicine and Hygiene, Vol. 1, No. 1, 1922, page 1-10.

Journal Bulletin No. 888, Part Twenty-Three, by Dr. H. H. Henshaw is being published in the Journal of the American Society of Tropical Medicine and Hygiene, Vol. 1, No. 1, 1922, page 1-10.

### Investigation of the

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## Drainage of Irrigated Lands

W. G. Sloan, D.E., spent most of the month on itinerary, inspecting drainage works in Southern California and later working out of Berkeley on investigations at Arbuckle, Grimes, Marysville, and Biggs. He returned to Boise by way of Klamath Falls, Oregon, where he visited the drainage systems on the Reclamation Service project.

W. A. Kelly, D.E., has accepted a position as appraiser for the Federal Farm Loan division of the Treasury Department, and expects to take up his duties there as soon as his present work can be closed up. He will be attached to the Omaha, Nebraska, branch.

F. L. Bixby, I.E., has submitted a report on a proposed drainage and flood control channel in Moapa Valley, Nevada. The report consists of a summary of the proceedings of the conference of landowners through whose land the channel is to be cut, and the estimate of cost, cross-sections and hydraulic computations of Mr. Bixby and his assistants.

### DRAINAGE INVESTIGATIONS

#### Administration

S. H. McCrory, Chief, left on September 28 for Nelson, B.C., to confer with officials of British Columbia regarding the drainage of the Kootenai River Valley. An effort is being made to develop a plan and an organization whereby the landowners in the province and in Idaho can effect the drainage of these lands on a joint basis. In returning to Washington he stopped at Berkeley, California, and then proceeded to Lovelocks and Minnemucca, Nevada, where he inspected the flood plains along the Humboldt River, with a view to securing information to devise a system of drainage and flood protection for those lands. After completing this inspection he resumed his return trip, stopping at Salt Lake City, Denver, and Chicago.

Jos. L. Chambers and Kay B. Knudsen have been appointed Junior Drainage Engineers.

Edward C. Thomes of Missouri has been appointed Drainage Engineer.

George A. Mitchell conferred with members of the staff and officials of the Department October 1-3.

F. W. Stanley, on October 10, at the eighth annual citrus seminar of the State Agricultural Experiment Station at Gainesville, Florida, read a paper on the results of five years investigation of irrigation of citrus groves.

From September 21 until about October 12, Guy A. Hart assisted H. M. Lynde with the drainage work in North Carolina. On October 10 he gave a demonstration in terrace construction on the Harmony Life School Farm at Harmony, North Carolina. He has returned to Montgomery, Alabama.

H. S. Yohe completed field studies of assessment and accounting methods and returned to the Washington Office.





## Construction, Operation and Maintenance

Recent contracts have been let as follows:

### In Western Iowa:

567,100 cu. yds. 8.48 miles of ditch, 14 ft. bottom for entire length of ditch except for 3,500 feet at lower end with a 20-ft. bottom, 12 ft. berm, at 7.99 cents. Estimated cost \$56,700.

### In Gibson, Crockett and Madison Counties, Tenn.:

1,772,000 cu.yds. Drainage District No.4 at \$0.0869 per yd.

### Lower Green River District, Henry County, Illinois:

	Length	Width	Aver. Depth	Total excavation
Main Ditch.....	29,300 ft.	60-ft. bottom	7-ft.	483,065 cu.yds.
Embankments.....				4,000 " "
Geneses Creek....	584 "	12- "	7- "	2,658 " "
			Total Excavation	489,723 " "

Contract awarded at 11-3/4 cents per cu.yds.

Work will be done with two 1-3/4 yd. clamshell full circle swing dredges.

## Farm Drainage

A report on tile drainage in South Carolina by F. G. Eason has been submitted to the Commissioner of Agriculture of South Carolina for publication as a bulletin of the State Department of Agriculture. Fifteen reports presenting plans for the drainage of individual farms were transmitted since the last news letter, and fourteen have been received.

## Overflowed Lands

D. G. Miller conferred with Dan Sullivan, County Drainage Commissioner, regarding the proposed Ottawa Lake Drainage District, Monroe County, Michigan, on September 14. Mr. Miller commenced a survey of that district on Sept. 17.

Fred F. Shafer completed the field work on the proposed Meadow Creek Drainage District and arrived at the Washington Office September 21.

### Reports Transmitted:

Saginaw River System, Michigan, by Geo. R. Boyd and Q. C. Ayres.

### Reports Received:

Rocky Ford Creek Drainage District, Hancock, Taliferro and Greene Counties, Georgia, by J. V. Phillips.

Fishing Creek Drainage District, Oglethorpe and Greene Counties, Georgia, by J. V. Phillips.

Powder Spring Creek Drainage District, Paulding and Greene Counties, Georgia, by J. V. Phillips.

Tchula Lake District, Holmes County, Mississippi, by O. G. Baxter.





## RURAL ENGINEERING Administration

E. B. McCormick, Chief, was absent from Washington on leave during the fore-part of September, making a western trip. He returned September 11.

J. A. Cook and J. E. Crux entered the Office on August 20 and 24, respectively, with temporary appointments as Architectural draftsmen.

### Domestic Water Supply & Sewage Disposal

Considerable time has been given to advice, consultations, and correspondence relating to water installations, water purification, and sewage disposal.

A household still received from a Chicago firm is to be set up and tested.

### Farm Structures

Wallace Ashby, formerly Barn Architect in this Office, who received a commission as 1st. Lieutenant in the Engineer Officers' Reserve Corps, was married to Miss Mary Little of Washington, D.C., before leaving for Camp Meade.

K. J. T. Ekblaw, who was on temporary appointment as Barn Architect, taking the place of Mr. Ashby, has resigned to become professor of farm engineering and head of that department at the Kansas State Agricultural College, Manhattan, Kansas.

C. Kruegl has returned to the Office after a month's leave, which he spent in California.

T. A. H. Miller has completed the working drawings and bills of materials for two sizes of sweet potato storage houses, both drawings and bills of material for these and two houses previously reported will be distributed to county agents in the South.

Working drawings for a reinforced concrete root storage house, 32 ft. by 50 ft. were completed, and revisions were made in the drawings of three storage cellars previously reported. Blueprints of the drawings are available for distribution.

Sketch plans and revisions were prepared by M. C. Betts for the laboratory building to be erected at Arlington for the Office of Public Roads and Rural Engineering.

### Mechanical Problems

Conferences were held in September, regarding the Farm Tractor Investigations, to be made jointly by this Office and the Office of Farm Management. A formal agreement as to the division of the work and a joint questionnaire have been under discussion, and have been disposed of.

A. M. Daniels is testing the experimental compressed air spraying outfit designed by this Office for the Bureau of Plant Industry.

# ADMINISTRATIVE ADMINISTRATION

E. H. McPherson, Chief, was absent from Washington on leave during the first part of September, making a vacation trip. He returned September 11.

J. A. Cook and J. E. Gray entered the Office on August 20 and 24, respectively, with temporary appointments as Architectural Draftsmen.

## Domestic Water Supply & Sewage Disposal

Considerable time has been given to advice, consultations, and correspondence relating to water installations, water purification, and sewage disposal.

A household still received from a Chicago firm is to be set up and tested.

## Farm Structures

Wallace Abby, formerly Farm Architect in this Office, who received a commission as Lieutenant in the Engineer Officers' Reserve Corps, was married to Miss Mary Little of Washington, D.C., before leaving for Camp Meade.

H. J. T. Enslin, who was on temporary appointment as Farm Architect, taking the place of Mr. Abby, has resigned to become professor of farm engineering and head of that department at the Kansas State Agricultural College, Manhattan, Kan.

C. Knebel has returned to the Office after a month's leave, which he spent in California.

T. A. H. Miller has completed the working drawings and bills of materials for two sizes of steel potato storage houses, both drawings and bills of material for these and two houses previously reported will be distributed to county agents in the South.

Working drawings for a reinforced concrete foot storage house, 22 ft. by 20 ft., were completed, and revisions were made in the drawings of other storage houses previously reported. Blueprints of the drawings are available for reference.

Sketch plans and revisions were prepared by W. C. Betts for the laboratory building to be erected at Arlington for the Office of Public Health and Rural Hygiene.

## Mechanical Problems

Conference was held in September, regarding the Farm Tractor Investigation, to be held jointly in this Office and the Office of Farm Management. A formal agreement was made for the division of the work and a joint questionnaire form was adopted, and have been proposed.

A. H. Daniels is testing the experimental compressed air spraying outfit designed by this Office for the Bureau of Plant Industry.



L. L. Beebe has been commissioned a captain in the Engineer Officers' Reserve Corps, but has not yet been assigned to duty.

Information Series #20, Corn Products Manufacture and Grain Handling, Storage, etc., has been compiled for use in correspondence.

General and special farm machinery questionnaires have been prepared in the Office, the former to form a part of the general questionnaire to be sent out next January, and the latter to form a part of a questionnaire to be distributed by the Crop Estimates Bureau in the near future.

Consultations and correspondence relating to the following subjects were handled:

Corn products manufacture	Lightning protection
Homemade farm implements	Ice houses
Bean threshers	Hydroelectric plants
Agricultural machinery	Power development of streams
Standards in wagon wheel manufacture	

A large chart containing the specifications for all tractors at present on the market is being made.

#### Traction Tests

L. L. Beebe has continued his work on traction test records.

#### Instrument Shop

The usual routine work was carried on, including repairs to office apparatus and automobiles, and the construction of new apparatus. The Mount Vernon Road was rolled.

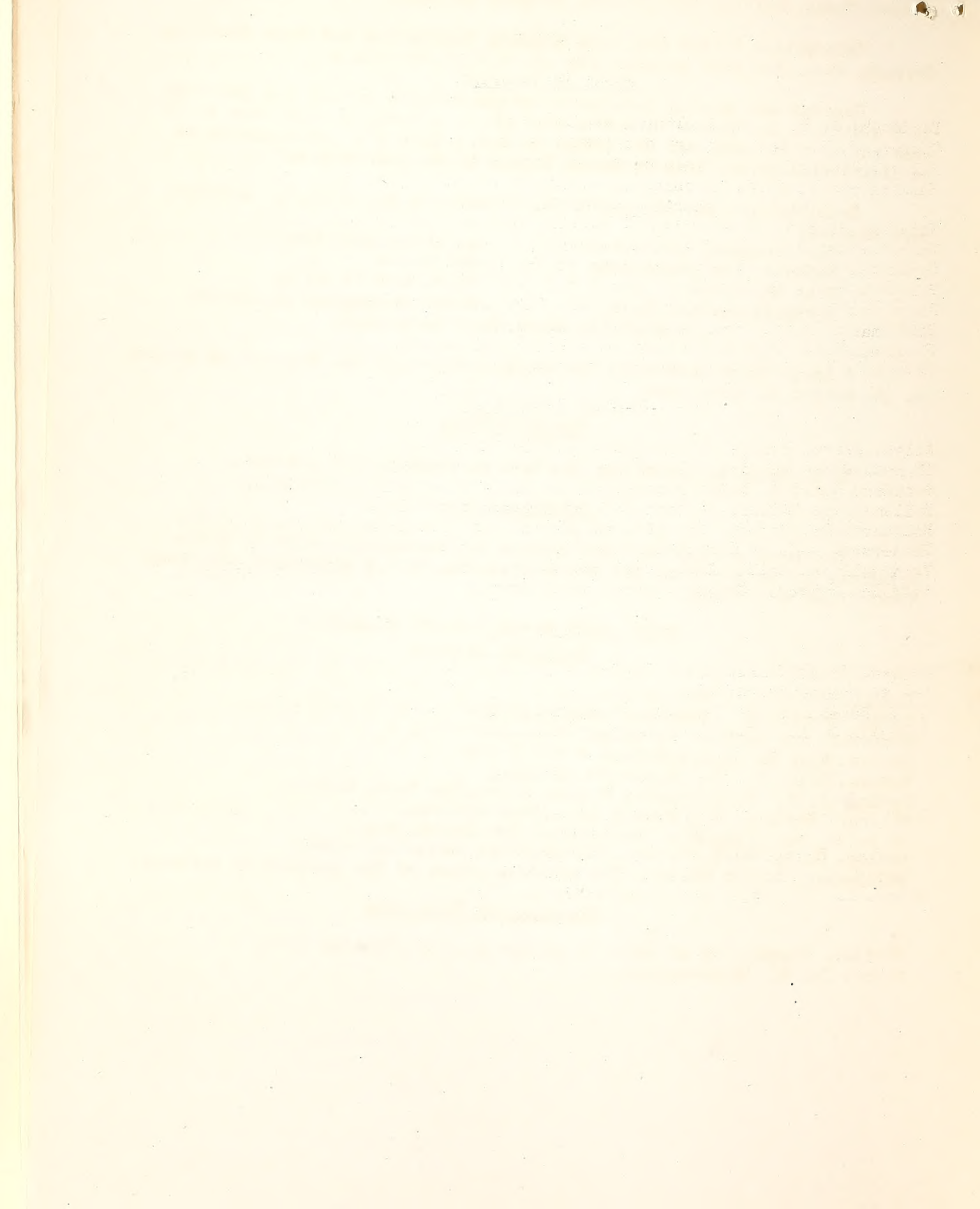
#### BOOKS ADDED TO THE LIBRARY COLLECTION

##### Roads and Bridges

Dewell, Henry D. Timber framing.  
Foote, Charles E. Practical road building.  
Greenwell and Elsdon. Practical stone quarrying.  
Harris, Elmo G. Road problems in the Ozarks.  
Hudson, Ralph G. The engineer's manual.  
Lovis, A. M. Massachusetts Highway Commission Curve Tables.  
Ravenel, Samuel. Road Primer for school children.  
St. Louis, Mo. City Plan Commission. The Kingshighway.  
Smoley, C. K. Smoley's parallel tables of slopes and rises.  
Wellington, Arthur Mellen. The economic theory of the location of railways.

##### Drainage and Irrigation

Fortier, Samuel. Use of water in irrigation. 2d. Edition 1917.  
Mason, Wm. P. Water-supply.





### Rural Engineering

Davidson. J. B. Agricultural engineering.  
Dunlap. J. H. The sanitary drinking fountain.  
Halsey. Frederick A. Handbook for machine designers, shopmen and draftsmen.  
Harding and Willard. Mechanical equipment of buildings, Vol. II. Power plants and refrigeration.  
Ketchum. Milo S. The design of walls, bins and grain elevators.  
McRae's Blue Book, 1917. (List of manufacturers of articles from iron & steel).  
Overholt. Virgil. The use of rope on the farm.  
Parsons. Henry de Berkeley. Steam boilers.  
Ramsower. Harry G. Equipment for the farm and the farmstead.  
Schiffman. Fritz. Farm wagons (translation).  
Shearer. H.A. Farm buildings, with plans and descriptions.  
White. F. M. Silos. Questions and answers.

### Testing Laboratory

Allen. Alfred Henry. Commercial organic analysis.  
Chamot. Emile Monnin. Elementary chemical microscopy.  
Gardner. Henry A. Paint researches and their practical application.  
Holleman and Walker. A text-book of organic chemistry.  
Molinari. Dr. Ettore. Treatise on general and industrial organic chemistry.  
Patterson. A.M. A German-English dictionary for chemists.  
Treadwell and Hall. Analytical chemistry. Vol. II. Quantitative analysis.  
Whipple. Harvey. Concrete stone manufacture.

### Economics

Federal Trade Commission. Fundamentals of a cost system for manufacturers.  
How to manage an office.  
U. S. Bureau of the Census. Financial statistics of States, 1916.  
Waddell. J. L. Technical book writing.

### General

American Society of Civil Engineers. Transactions, 1904 to 1916, inclusive.  
(Loaned by Mr. Bishop)  
Cleveland Engineering Society. The Conquerors.  
Dick. William B. Encyclopedia of practical receipts and processes.  
Hewes. L. I. Nomograms of adjustment.

## General Engineering

Whitely, J. B. Agricultural engineering.  
Whitely, J. B. The sanitary drinking fountain.  
Halsey, Frederick A. Handbook for machine designers, shopmen and draftsmen.  
Halsey, Frederick A. Mechanical equipment of buildings, Vol. II. Power plants and refrigeration.  
Ketchum, Will. The design of walls, piers and grain elevators.  
McRae's Blue Book, 1917. (List of manufacturers of articles from iron & steel.)  
Overholt, Virgil. The use of rope on the farm.  
Parsons, Henry de. Steam boilers.  
Parsons, Henry de. Equipment for the farm and the farmstead.  
Schillman, Fritz. Farm wagons (translation).  
Shoemaker, H. A. Farm buildings, their plans and descriptions.  
White, T. M. Slips. Questions and answers.

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Allen, Alfred Henry. Commercial organic analysis.  
Chamot, Emilie Monnier. Elementary chemical microscopy.  
Gardner, Henry A. Paint researches and their practical application.  
Hollman and Walker. A text-book of organic chemistry.  
Muller, Dr. Victor. Treatise on general and industrial organic chemistry.  
Payson, A. M. A German-English dictionary for chemists.  
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